New supervised multi layer feed forward neural network model to accelarate classification with high accuracy.

ABSTRACT

The main problem for Supervised Multi-layer Neural Network (SMNN) model such as Back propagation network lies in finding the suitable weights during training in order to improve training time as well as achieve high accuracy. The important issue in the training process of the existing SMNN model is initialization of the weights which is random and creates paradox, and leads to low accuracy with high training time. In this paper, a new Supervised Feed Forward Multi-layer Neural Network (SFFMNN) model for classification problem is proposed. It consists of a new preprocessing technique which combines data preprocessing and pre-training that offer a number of advantages; training cycle, gradient of mean square error function, and updating weights are not needed in this model. In new SMFFNN model, thresholds of training set and test set are computed by using input values and potential weights. In training set each instance has one special threshold and class label. In test set the threshold of each instance will be compared with the range of thresholds of training set and the class label of each instance will be predicted. To evaluate the performance of the proposed SMFFNN model, a series of experiment on XOR problem and two datasets, which are SPECT Heart and SPECTF Heart was implemented with 10- fold cross-validation. As quoted by literature, these two datasets are difficult for classification and most of the conventional methods do not process well on these datasets. Our results, however, show that the proposed model has been given high accuracy in one epoch without training cycle.

Keyword: SMNN; SMFFNN; Training; Epoch; Preprocessing; Pre-training.